

INTEGRATED COMPACT DISC HOLDER FOR A PORTABLE DEVICE

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BACKGROUND

Portable electronic devices continue to grow in popularity as various functionalities that were previously only available from stationary devices become available from portable devices.

It is often desirable to carry one or more compact discs (CDs) along with a given portable device as one moves from place to place. For example, if the portable device comprises a peripheral device that is configured for use in conjunction with a computer, the user may wish to carry along a read-only memory CD (CD-ROM) that comprises one or more drivers for the portable device and/or user applications that are designed to access and control the portable device with the computer. By carrying along the CD-ROM, the user may be able to use the device, even if the user only has access to a computer that does not yet comprise the necessary software.

To cite another example, if the portable device includes a disc drive (*e.g.*, an audio CD drive, a CD-ROM drive, or a digital video disc (DVD) drive), the user may wish to carry along one or more extra discs beyond that which is currently within the disc drive. This could be the case with, for instance, a CD player, a notebook computer, or a game console.

Although the user can carry one or more compact discs in a separate disc carrier or through other means (*e.g.*, in one's hand, in a jacket pocket, *etc.*), it may be

cumbersome and/or inconvenient for the user to do so, particularly in cases in which the user must carry other items (e.g., when travelling). Accordingly, it can be appreciated that it would be desirable to have a CD holder that facilitates convenient carrying of a CD along with a portable device.

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SUMMARY

Disclosed are portable electronic devices and methods for securing compact discs to the devices. In one embodiment, a portable electronic device comprises a compact disc holder integrated with the portable electronic device, the compact disc
10 holder being adapted to secure a compact disc on the portable electronic device.

In one embodiment, a method for securing a compact disc to the exterior of a portable electronic device comprises securing the compact disc to a compact disc holder integrated with the portable electronic device.

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BRIEF DESCRIPTION OF THE DRAWINGS

The disclosed apparatus and methods can be better understood with reference to the following drawings. The components in the drawings are not necessarily to scale.

FIG. 1 is a perspective top view of an embodiment of an example portable device.

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FIG. 2 is a perspective bottom view of the portable device of FIG. 1, illustrating a first embodiment of a compact disc holder of the device.

FIG. 3 is a perspective bottom view of the portable device of FIG. 1, and illustrates the process of attaching a compact disc to the compact disc holder shown in FIG. 2.

FIG. 4 is a perspective bottom view of the portable device of FIG. 1, shown with
5 a compact disc attached to the compact disc holder shown in FIG. 2.

FIG. 5 is a bottom view of an embodiment of another example portable device, illustrating a second embodiment of a compact disc holder.

FIG. 6 is a cross-sectional view of a portion of the compact disc holder shown in FIG. 5, the cross-sectional view taken along line 6-6 of FIG. 5.

10 FIG. 7 is a bottom view of the portable device of FIG. 5, shown with a compact disc attached to the device using the compact disc holder shown in FIG. 5.

FIG. 8 is a bottom view of an embodiment of a further portable device, illustrating a third embodiment of a compact disc holder.

FIG. 9 is a cross-sectional view of the compact disc holder shown in FIG. 8, the
15 cross-sectional view taken along line 9-9 of FIG. 8.

FIG. 10 is a bottom view of the portable device of FIG. 8, shown with a compact disc attached to the device using the compact disc holder shown in FIG. 8.

FIG. 11 is a bottom view of an embodiment of yet another portable device, illustrating a fourth embodiment of a compact disc holder.

20 FIG. 12 is a bottom view of the portable device of FIG. 11, shown with a compact disc attached to the device using the compact disc holder shown in FIG. 11.

DETAILED DESCRIPTION

As identified above, it would be desirable to have a compact disc (CD) holder that facilitates convenient carrying of a CD, such as an audio CD, a read-only memory CD (CD-ROM), a recordable CD (CD-R), a read/write CD (CD-WR), or a digital
5 video disc (DVD), along with a portable device. As is described in the following, one or more such CDs can be releasably attached or retained by a CD holder that is integrated into the portable device such that the one or more CDs may be easily carried along with (*i.e.*, on) the portable device without separate effort.

Disclosed herein are various embodiments of CD holders and portable devices
10 that incorporate them. Although specific embodiments are shown in the figures and are described herein, these embodiments are provided for purposes of example only to describe the CD holders and portable devices.

Referring now in more detail to the drawings, in which like numerals indicate corresponding parts throughout the several views, FIGS. 1-4 illustrate a first portable
15 device 100 that includes an integrated CD holder. With reference first to FIG. 1, the portable device 100 can, for example, comprise a portable flatbed scanner. Therefore, the portable device 100 can include a pivotable lid 102 (shown in the closed position) that covers a scanner platen (not visible in FIG. 1). Although a portable flatbed scanner is illustrated in FIG. 1 and has been explicitly identified herein, the portable device 100
20 more generally may comprise any portable electronic device with which a user may wish to carry a CD, whether it be for purposes of later inserting the CD into a drive of the portable device or into a drive of a separate device (*e.g.*, personal computer (PC)) that is to be used to access and control the portable device. Accordingly, other possible

portable devices may include, for example, CD players, notebook computers, tablet computers, portable printers, portable disk drives, peripheral CD readers and/or writers, personal digital assistants (PDAs), digital cameras, mobile telephones, game consoles, portable stereos, *etc.*

5 Irrespective of the particular configuration of the portable device 100, the device comprises a device housing 104 is made of an appropriate material, for instance a plastic material that has been injected into a mold to form the housing. The housing 104 comprises various sides that enclose the internal components (*e.g.*, processor(s), memory, motors, *etc.*) of the portable device 100. On one of the sides of the device
10 housing 104 is provided a CD holder. In the embodiment of FIGS. 1-4, a CD holder 106 is provided on a mounting surface 108 of the portable device 100 that is integrated into the bottom of the device 100. As illustrated in FIG. 2, the CD holder 106 comprises a central opening retainer 110 that is adapted to receive a central opening of a CD. The central opening retainer 110 comprises a plurality of resilient tabs 112 that are adapted
15 to engage the central opening of the CD. In some embodiments, the central opening retainer 110 is unitarily-formed with the mounting surface 108 such that the retainer may be molded along with the mounting surface (and the housing side on which it is created). Such an arrangement avoids unduly increasing manufacturing costs and typically does not significantly add to the unit cost of the device 100. By way of example, the central
20 opening retainer 110 can have a configuration similar to that of a retainer of a conventional CD jewel case.

In addition to the retainer 110, the CD holder 106 may comprise one or more ridges 114 that are adapted to trace at least a portion of the edge of a CD when attached

to the CD holder 106. When used, the ridges 114, and potentially resilient feet 116 of the portable device 100, may support the portable device when placed on a flat surface (e.g., desk) so as to protect the CD when in place in the CD holder 106. Notably, however, such ridges may not be necessary in cases in which the central opening retainer
5 110 and an area just larger than the area of a CD to be attached to the holder are recessed into the mounting surface 108 of the device 100. Such configuration provides added protection to the CD.

With particular reference to FIGS. 3 and 4, use of the CD holder 106 will be described. Referring first to FIG. 3, the portable device 100 is oriented so that the user
10 has access to the mounting surface 108, in this case the bottom of the device. Next, the user moves a CD 118 to be attached to the CD holder 106 toward the holder, as indicated by directional arrows 120. As shown in FIG. 3, the CD 118 (which may comprise any one of an audio CD, a CD-ROM, a CD-R, a CD-RW, a DVD, or other such disc) includes a central opening 122. Once the CD 118 comes into contact with the
15 CD holder 106 so that the central opening retainer 110 aligns with the central opening 122 of the CD, the CD may be pressed down to urge the resilient tabs 112 of the retainer into the CD central opening 122. Such urging causes the tabs 112 to flex inwardly so as to apply an outward force on the CD central opening 122 that retains the CD 118 in place on the holder 106. To remove the CD 118, the resilient tabs 112 may be flexed
20 further inward to release the CD by pressing them down with one's finger. However, the CD 118 may simply be removed by pulling it upwardly away from the mounting surface 108 in that the tabs 112 will automatically flex to permit the CD to be removed.

FIGS. 5 and 7 illustrate a second portable device 200. Like the first portable device 100 shown in FIGS. 1-4, the portable device 200 can comprise any portable electrical device with which a user may wish to carry a CD. The portable device 200 includes a housing 202 that comprises a mounting surface 204. Provided on the mounting surface 204 is another CD holder 206 and, optionally, resilient feet 208.

The CD holder 206 of the embodiment of FIGS. 5-7 includes two opposed rails 210 that are used to retain a CD 212. By way of example, the rails 210 are unitarily-formed with the mounting surface 204 in an appropriate molding process. FIG. 6 provides a detail view of one of the rails in cross-section. As indicated in FIG. 6, each rail 210 comprises a side wall 214 that extends up from the mounting surface 204, and a cover member 216 that extends out from the side wall toward the opposing rail such that each rail may be considered a closed rail. As is further indicated in FIG. 6, each rail 210 may further include a resilient member 218 that is used to secure the disc 212 when inserted between the rails (FIG. 7). By way of example, the resilient members 218 may comprise a dense foam member or rubber grommet that is inserted into the rails 210 under the cover members 216. Alternatively, the resilient members 218 may comprise resilient tabs that are unitarily-formed with the rails 210 and, optionally, with the mounting surface 204. As indicated by hidden lines in FIG. 5, the resilient members 218 may be positioned approximately halfway along the length of the rails 210 such that the members are adapted to engage the edges of the CD 212 when it is fully inserted between the rails. More particularly, the resilient members 218 may be positioned, sized, and configured so as to deform when the CD 212 is fully inserted between the rails 210 so as to firmly engage the CD.

With further reference to FIG. 5, the CD 212 is attached to the CD holder 206 by sliding the CD between the rails 210, underneath the cover members 216, in the direction indicated by directional arrow 220. As the CD 212 makes contact with the resilient members 218 of the rails, the resilient members are deformed outwardly so as to apply force to the edges of the CD. Once the CD 212 is fully inserted between the rails 210, as indicated in FIG. 7, the resilient members 210 may be significantly deformed so as to firmly hold the CD such that it will not accidentally slide out of the CD holder 206 (compare the orientation of the resilient members in FIG. 5 with that of FIG. 7). However, the resilient members 210 do not hold the CD 212 so forcefully as to prevent removal of the CD by a user. Accordingly, the CD 212 can be removed by simply sliding the CD out from the rails 210 (*e.g.*, in the opposite direction of directional arrow 220 in FIG. 5) until fully removed from the CD holder 206.

Although not illustrated in FIGS. 5-7, the CD holder 206 could, optionally, further include additional retaining means to ensure secure holding of the CD 212. For instance, such additional retaining means could comprise one or more tabs or latches that extend inwardly from one or both of the rails 210 to press down on the CD 212 when slid between the rails. In an alternative arrangement, such a tab or latch could extend from one of the rails 210 and pass through the central opening of the CD 212 to secure it in place. When such additional retaining means are implemented, they can, optionally, be unitarily formed with the mounting surface 204 to facilitate molding of the CD holder 206 along with the mounting surface.

FIGS. 8 and 10 illustrate a third portable device 300. Like the first and second portable devices 100 and 102, the portable device 300 can comprise any portable

electrical device with which a user may wish to carry a CD. The portable device 300 includes a housing 302 that comprises a mounting surface 304. Provided on the mounting surface 304 is a further CD holder 306 and, optionally, resilient feet 308.

The CD holder 306 operates in a similar manner to the CD holder 206 of the embodiment shown in FIGS. 5-7. However, instead of comprising two rails, the CD holder 306 comprises a pocket 310 in which a CD 312 may be inserted. This pocket 310 can be unitarily-formed with the mounting surface 304, for instance through a molding process, or can be attached to the surface after fabrication of that surface, for instance by gluing or polymer welding. In either case, the pocket 310 is formed of a resilient material, such as a plastic or vinyl material, and is sized and configured such that the CD 312 fits snugly therein to ensure that the CD does not accidentally slip out of the pocket during movement of the portable device 300.

The construction of the pocket 310 is shown in greater detail in the cross-sectional view of FIG. 9. As shown in that figure, the pocket 310 is relatively thin and, in conjunction with the mounting surface 304, forms an interior space 314 in which the CD 312 can be disposed.

With reference back to FIG. 8, the CD 312 is attached to the CD holder 306 by sliding the CD into the pocket 310 in the direction of directional arrow 316. As noted above, the pocket 310 is sized and configured such that the CD 312 fits snugly within the pocket to securely hold the CD in place. However, the CD 312 can be removed by simply sliding the CD out from pocket 310. Optionally, a notch 318 formed in the pocket 310 (FIGS. 8 and 10) can be used to obtain a better grip on the CD 312 when removing it from the CD holder 306.

FIGS. 11 and 12 illustrate a fourth portable device 400. Like the portable devices described above, the portable device 400 can comprise any portable electrical device with which a user may wish to carry a CD. The portable device 400 includes a housing 402 that comprises a mounting surface 404. Provided on the mounting surface
5 404 is yet another CD holder 406 and, optionally, resilient feet 408.

The CD holder 406 is similar to the CD holder 206 of FIGS. 5-7 in that the CD holder 400 comprises opposed rails 410. In the embodiment of FIGS. 11 and 12, however, each of the rails 410 is open and comprises an elongated resilient portion 412 that can deform outwardly to accommodate a CD 414. The elongated resilient portions
10 412 are unitarily-formed with the open rails 410, which likewise may be unitarily-formed with the mounting surface 404, so as. However, the elongated resilient portions 412 are not fixed in place with respect to the mounting surface 404, so as to enable their outward deformation.

With reference to FIG. 11, the CD 414 is attached to the CD holder 406 by
15 sliding the CD between the open rails 410 in the direction of directional arrow 416. As the CD 414 is slid between the open rails 410, the edges of the CD contact the elongated resilient portions 412 and push them outwardly until, as indicated in FIG. 12, the CD is securely held in place between the rails through force exerted on the CD by the now deformed elongated resilient portions.